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Quality Adequacy of Architectural Spaces and Elements of Design of Worship Places: Reports from Male Students Hostel Mosques, Ahmadu Bello University, Zaria

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Quality adequacy as a concept has been used over the years by scholars as a building evaluation process to achieve building improvement and enhancement of building performance. Specifically, to identify certain phenomenon of buildings such as building performance, assessment of building users' satisfaction and quality adequacy of building spaces and elements. This paper aims to assess the quality and adequacy of spaces and elements of design using male student's hostel mosques from Ahmadu Bello University, Zaria as case study. In undertaking this study, the research strategy adopted was essentially a survey approach triangulated with cases study approach. Three male students hostel mosque were selected as case studies. A self-administered questionnaire developed based on the Likert scale was the key data collection instrument in which two hundred and ten copies were distributed (DN=210) to students who serve as respondents across the three mosques. Out of this number, one hundred and thirty-two (RN= 132) were returned representing sixty-two percent (62.8%). Findings indicate that the highest percentage of respondents (42%) were of the opinion that prayer hall in Dangote hostel has very low quality in contrast to majority of respondents in Sassakawa (29.8%) that indicated very high quality on prayer hall. Similarly, the highest number of respondents (48.4%) rated visual quality of lighting and luminance as moderate in Danfodio hostel mosque whereas this was rated very high in Sassakawa. Overall, the ''quality and number of entrances for ease of entry and exit'' with HQI = *.729* made the highest contribution towards the quality of hostel mosque while toilet facility with Quality Habitability Index (HQI) = *.296* made the least contribution. These results suggest that the toilet facilities and other elements with low HQI values need immediate architectural solutions to enhance their quality adequacy while those with high HQI value need to be maintained to remain in their current quality adequacy statuses.

Keywords: Quality, Adequacy, Ahmadu Bello University, Zaria, Mosque, Hostel

Introduction

The overall quality adequacy (QA) of buildings in use and their support services in a university setting like in any other built environment is known to be affected by many factors. Few among these factors include number of users of the facility (Monk, 2006) personal traits of occupants (Cook & Bruin, 1994), construction processes adopted (Abas *et al.,* 2015; Gunaydin, 1998) and material specifications, provided services and facilities (Adeoye, 2015: Olotuah, 2002). The Ahmadu Bello University, Zaria as one of the leading public university in Nigeria is confronted with three problems in terms of maintaining the quality of its buildings and specifically on-campus hostel mosques. The first is the high number of accommodated students in the on-campus hostels which stood at over ten thousand (Garba, 2017). Secondly, the diversity of students that

came from different sociocultural backgrounds and which affect use pattern of the hostel facilities. The last problem as observed was due to lack of exposure among indigent students on use of some of the provided facilities in the hostel which result in their mis-use (Tulpule, 2019). Hence, this paper sets out to assess the QA of hostel mosque under two main components; quality adequacy of the physical aspects of the mosque building and provided facilities and quality of the technical aspects of the mosque design and its support services. Furthermore, under the physical aspects, the quality of Architectural Spaces/Elements as well as provided facilities were assessed. Similarly, under the technical aspects of the mosques, technical Qualities of Main Mosque Design and Support Services were assessed.

Over the years, many benefits were derived for the outcomes of studies on QA of buildings specifically from the user's perception. These include the use of QA as a feedback system to building managers and administrators as basis for building improvement and streamlining building services to what the current occupants actually need (Zimmerman & Martin, 2001), predicting building quality as well as serving as guide to developers to take informed decisions on improving proposed buildings (Cooper, 2001). On campus hostels for example, results of many studies indicated higher satisfaction with the provided facilities including worship places (Hassanain, 2008; Olujimi & Bello., 2009). Whereas there are extant studies that have covered vast areas of interest on housing quality adequacy in Nigeria (see the works of Jiboye, 2004; Coker, Awokola, Olomolaiye, & Booth, 2007; Fatoye, & Odusami, 2009; Wahab, Adedokun, & Onibokun 1990). There are however, lack of current studies that assessed QA of mosques as worship places and specifically in university environment in Nigeria. This paper therefore attempts to fill this gap by assessing the QA of on-campus hostel mosques of Ahmadu Bello University, Zaria, as a case study. The following objectives were set in order to realize the aim:

i) Provide contextual understanding of the concept of quality adequacy in general and how it has previously been used to assess building users' perceptions as a feedback system
ii) Use the concept of quality adequacy to identify the current statuses of the physical and technical aspects of selected mosques as well as provided facilities and support services.
iii) Suggest prescriptive measures towards enhancing the overall quality and adequacy of the studied mosques of Ahmadu Bello University, Zaria.

The Concept of Quality Adequacy

Going through the heap of current literature around the concept of ''quality'' leads one to conclude that there is absence of universally acceptable definition across all disciplines (Mukhtar *et al*., 2018). A look at the word ''quality'' as defined from various perspectives only adds to the above assertion. For example, the American Public Housing Association (1964) ascribed four attributes such as habitability, affordability and ability to provide occupants' physiological and psychological needs as key ingredients of quality adequacy (Ibem & Omole referred to the works of Onibokun, 1985). On the other hand, a United Nations document (UN-HABITAT) prepared on shelter issues in 2006 affirms that the concept 'quality' addresses '' specific cultural, social, environmental and economic factors" of building users or occupants and hence varies from country to country. Moreover, the works of Onion (1984) opined that quality is a function of both a mental and moral attribute of things under investigation. In a broader context, very recent works of Rustom & Mohammad (2019) seem to suggest that ''quality'' is an expression of human experiences about phenomena, opinions and sometimes assertions even though in the absence of incomplete information. However, in line with the works of Mc Canny (1972) who opined that ''quality'' depends largely on the building user's desires, aspirations as

well as the factor being considered, this study shall refer to quality as measures of student's perception on the physical state and condition of repairs of the mosque facilities, support services and overall adequacy of architectural spaces and elements provided.

Concept of Quality Adequacy as a Function of Post Occupancy Evaluation

Scholars concerned with the built environmental quality have over the years assessed the perceptions of respondents to identify certain phenomenon, trends or outcomes in relation to their physical environments. Some of these include the works that evaluated building performance, assessment of satisfaction level of building users and occupants (and its elements) and quality adequacy of building spaces and elements (Mustafa, 2017; Tao *et al*., 2014; Abdel-Razeq, 1998). The contextual definition of post occupancy evaluation, (POE) as suggested by Zimring & Reizenstein, (1980) centered on examination of the effectiveness of buildings. The scholars identified three dimensions of focus when measuring/evaluating occupant's perception which include generality, breath of focus and applicability. According to Isaac *et al.* (2009), the nature and the target aim of POE should be specific rather than generic, in other words the outcomes of POE studies actually depend on all participants such as the interviewer, respondents as well as the tool being administered. Few examples of the popular use of POE as a feedback system include the works of Amerigo & Aragones (1990) and Fatoye and Odusami, (2009) among others. Similarly, studies that adopted the POE to assess building performance and quality adequacy of buildings based on user's perception are also numerous (Ashouri *et al.*, 2019; Olotuah, 2006: Olatunbosun, 2018). With reference to application of POE to housing, Muoghalu (1991) assessed housing environmental quality, Zubairu (2002) quality of urban life and Bello and Egresi (2017) that assessed housing design and housing condition. Moreover, studies conducted by Zealand (2019), assessed the structural quality and socio-cultural values of housing occupants and adequacy of public housing. Moreover, there are scholars who focused on the tangible aspects of housing such as Ferrell *et al*. (1977) that correlated socioeconomic variables of occupants to the physical adequacy of their residential house, Arslan (2011) assessed the quality of African traditional compound house in Ghana. Yet, other scholars include Xiaolong *et al*. (2019) who undertook quality assessment on multi-family attached house and challenges and Adeoye (2015) who conducted similar studies on urban housing quality.

There are also studies that focused on assessing 'quality'' of student's housing as an integral part of student's facility. Students hostel including its facilities in tertiary institutions perform key functions towards helping the students to achieve social values such as personality development, self-confidence and discipline as well as physical settings to achieve calm and peace (Sunday & Yahaya, 2019), as well as serve as a pivot of social, psychological and symbolic significance (Smizik & Stone, 1988; Stone, 1986, both cited in Cook & Bruin, 1994). Due to lack of studies which focused on worship places in student's hostels, this paper therefore, aims to assess the quality adequacy of mosque as a facility which provides not only the physical setting for worship activities (Hamza & Aliyu, 2019) but also supports and facilitate other socio-cultural activities among students (Dewiyanti *et al*., 2016; Hamza & Ladan, 2018; Hamza & Bello, 2018). In view of the above, therefore, there is the need to analyze on-campus student's perception on the level of current mosque building quality and adequacy of elements and facilities in their hostels in view of its importance towards developing framework for improvements both in quality and adequacy.

Research Methodology

In this paper a survey approach was adopted using three cases as the subject of enquiry. The case study approach is necessary since

it is ''defined by interest in individual cases, not by the methods of inquiry used'' (Stake, 1994). A questionnaire survey which has previously been used in post occupancy evaluation studies as evident in the works of Ibem and Amole (2015); Horgen and Sheridan (2015), and Elvis *et al.* (2017) was adopted as the key primary data collection instrument. However, three mosques including Dangote, Sassakawa and Danfodio hostels which correspond to fifty percent of the sampling frame were selected as case studies. The other three were not used for different reasons. The Danfodio hostel mosque is presently under construction, students presently use a zinc structure for worship. The mosque in ICSA/Ramat mosque was under lock and key due to local skirmishes that ensued among students and hence cannot be used. Based upon a similar work conducted by Oladapo (2006 cited in Ibem & Amole, 2015), a total of two hundred and ten copies of the questionnaire were distributed (DN=210) to the respondents, seventy in each mosque in which one hundred and thirty-two were returned and usable (RN= 132) representing over sixty-two percent (62.8%).

Analysis conducted was undertaken at three levels; in section A, basic descriptive statistics in statistical software for social sciences (SPSS) software package was used to described respondent's demographic characteristics using frequencies (*Fq*) and corresponding percentage (%). The data which emanated from sections B was analyzed to determine the level of adequacy of all measured variables (LQ) which was presented in percentage (%). The formula used as shown below calculates the total number of respondents that selected the various quality options as presented in the questionnaire. The analysis result shows the level and number of respondents that indicated QA of variables in percentage.

$$LQ = a/b = p/100$$

Level of Quality Adequacy of Measured Variables (LQ)

Similarly, the last analysis undertaken was to assess the Habitability Quality Index (HQI) of variables. The HQI was aimed at determining the contributions of each of the variables makes towards the overall quality adequacy or otherwise of the mosque. In other words, HQI measures the actual scores given to all variables by all respondents and divided by the maximum values that could possibly be scored by any given variable by all respondents. In the formulae as shown below, HQI is the habitability quality index, QAS**1** represent all scores given by all respondents to a particular variable (which were added up). This sum was divided by QAS**2** which represents the maximum scores possible for that variable (which were also added up).

$$HQI = \frac{\sum QAS_1}{\sum QAS_2} \quad \ldots\ldots\ldots\ldots\ldots$$

Habitability Quality Index of Measured Variables (HQI)

The Study Area

Ahmadu Bello University is located on latitude 11.1512° N, and latitude 7.6546° E. Its current student's population stood at over fifty thousand at both undergraduate and post graduate levels out of which atleast ten thousand are accommodated in on-campus hostels (Garba, 2019). The university has two campuses in Zaria, the main campus in Samaru and Congo campus in Gyallesu area respectively. In the main campus, where the study was conducted six male student's hostels were identified including Danfodio, Sassakawa, Oba Akenzua and ICSA/Ramat hostels in the old site while two others consisting of Aliko Dangote hall and Shehu Idris (*Sarkin Zazzau*) in the second phase area of the university. Figure 1 below shows the map of Ahmadu Bello University showing the selected mosques and the hostels where they are located.

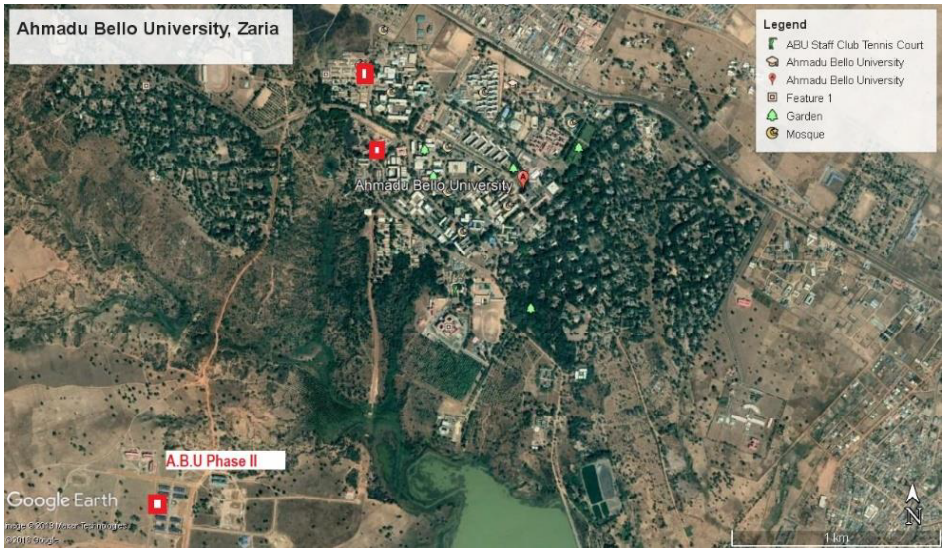

Figure 1. Map of Ahmadu Bello University, Zaria Samaru Campus Showing the Three Selected On-Campus Male Students Hostels Mosques that Include Danfodio (Top Left), Sassakawa (Top Middle) And Aliko Dangote Hall Mosques (Below Left) in The Phase II Site.
(Source: Adapted from Google Earth, 2019)

Architectural Characteristics of Selected Mosques as Variables of Quality Adequacy

Danfodio hostel is the oldest mosque among the three case studies. Architecturally, it is a small structure measuring about six meters by six meters (36sq.m) demarcated by a dwarf wall in a perimeter area of twelve meters by fifteen meters on all sides as shown in Figure 2 (a-b). In contrast however, the Sassakawa hostel which measures about twice the size of Danfodio hostel (88.0 Sq.m) was constructed in the early 2000 (Figure 2 (c-f). The Dangote hall on the other hand is the most recent having been completed only two years ago. The structure being used as the mosque in the hostel was a converted structure that measures about six meters by eight meters' in length (48 Sq. m).

The architectural characteristics of the mosques under study here refer to the type, configuration and nature of spaces and elements including provided facilities. The architectural characteristics that were assessed across all three mosques, under the physical aspect of the mosque building include the prayer hall (congregation hall), ablution fountain, prayer niche, Imams office, availability and quality of design for disabled persons, quality of and number of entrances for ease of access and exits. Others include the aesthetics aspects that include external and internal appearances of the mosque. The provided facilities that were also assessed include toilet facility, quality of accessibility to the mosque, shoe racks and shelves for keeping the Quran and other religious books and type of floor finishes used for delineating congregants (*sahu)*. Similarly, the technical aspects of the mosque assessed include the visual quality of lighting and luminance, thermal comfort (natural ventilation) and indoor air quality in prayer halls, acoustic control (noise from outside mosque), structural integrity of mosque building (presence or absence of cracks in walls and signs of leakages of roofs) and quality of clerestory lighting. Similarly, the quality of mosque support services assessed under the technical aspects include the quality adequacy of sanitation (cleanliness of spaces, places and facilities), elements of security (quality of entrance doors and windows), fire safety (adequate number and marking of fire escape routes), water supply (availability and quality) and quality of electricity services.

Figure 2 (a-d). Showing case studied mosques (a-d). The Danfodio mosque (a&b) as shown measured 36sq.m but with a vast covered prayer area darmacated using a dwaf wall. The Sassakawa mosque (c & d) however, measured 88.0sq.m but with a smaller covered prayer area. Source: Authors Survey, (2020)

Results of Analysis

Demographic characteristics of respondents

The results of demographic characteristics indicated that the age range of majority of respondents (above 40% in all mosques) were between 21-25 years old and almost all (90%) were single as shown in Table 1. Similarly, majority of respondents across the three mosques (Dangote 76.0%, Danfodio, 96.8% and Sassakawa, 33.3% respectively) reported to have worshipped in the mosques between periods of 1-5 years. On the most frequented prayer by respondents however, the results show that while in Dangote hostel, majority of respondents (40. %) prayed the *Magrib* (early evening) prayer followed by *Asr* (late afternoon) prayers (26. %), in Danfodio and Sassakawa however, majority (41.9% and 33.3%) offered *Asr* prayers followed by *Zuhr* (afternoon) prayers (16.1%) in Danfodio hostel and *Magrib* prayers 17.5% in Sassakawa mosque respectively.

Furthermore, findings of other activities undertaken by respondents and the time spent is as shown in Figure 1 (a&b) respectively. The results indicated that majority of respondents (51.1%) undertook ''reading'' followed by learning the Quran and other religious books (35. 5%) in Danfodio hostel. On the other hand, the least number of respondents undertook ''social'' activity in the mosques while the highest number of respondents who spent average of between 5-15 minutes (60%) were found in Dangote hostel. However, atleast 8.8% of respondents spent above 40 mins for other activities in the Sassakawa mosque.

Table 1: Demographic Characteristics of Respondents Across Case Studied Mosques

Mosques Studied		Danfodio *Freq*	Hostel *(%)*	Dangote *Freq*	Hostel *(%)*	Sassakawa *Freq*	Hostel *(%)*
Gender	Male	31	100	50	100	51	100
Age Range of Respondent	16-20 yrs.	11	35.5	15	30	17	29.8
	21-25 yrs.	14	45.2	22	44	18	31.6
	26-30 yrs.	5	16.1	10	20	7	12.3
	31-40 yrs.			2	4	5	8.8
	Above 40 yrs.					3	5.3
Marital Statuses of Respondents	Single	30	96.8	33	66	26	45.6
	Married	1	3.2	11	22	10	17.5
	Divorced					3	5.3
	Widowed			2	4	7	12.3
Length of Worship by Respondents in This Mosque	1-5 yrs.	30	96.8	38	76.	39	68.4
	6-10 yrs.	1	3.2	1	2		
	11-15 yrs.			3	6		
	above 15 yrs.						
Prayers Frequented by Respondents in This Mosque	Subh	7	22.6	6	12	5	8.8
	Zuhr	5	16.1	5	10	6	10.5
	Asr	13	41.9	13	26	19	33.3
	Magrib	4	12.9	20	40	10	17.5
	Isha					1	1.8
Time Spent by Respondents in Mosque for Worship (Minutes)	5-15	12	38.7	21	44	9	15.8
	16-25	9	29	10	20	3	5.3
	26-40	4	12.9	3	6	5	8.8
	Above 40	4	12.9	2	4	1	1.8
	N = 132	31		50		51	

Key- Freq – Frequency of Responses., (%)- Corresponding Percentage of Responses

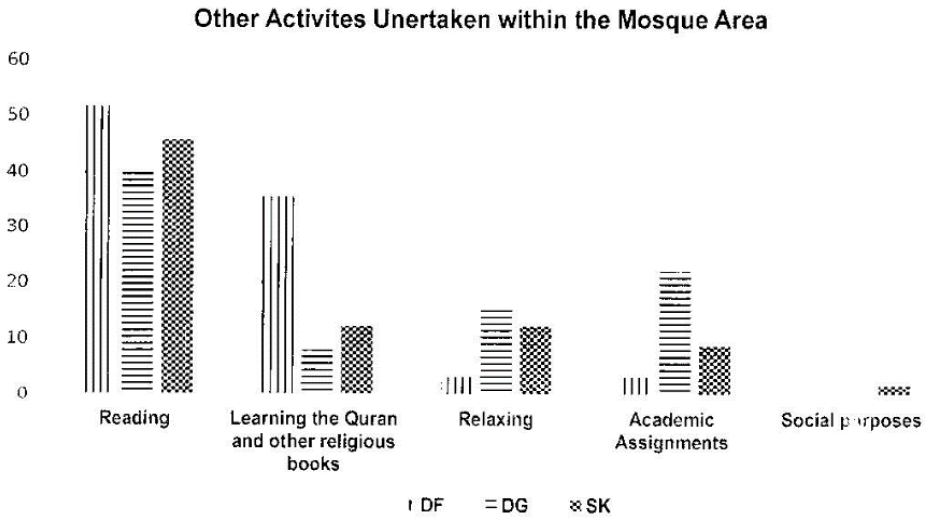

Figure 1(a): Number of Respondents who undertook other Activites in the Mosque Area in Percentage (%)

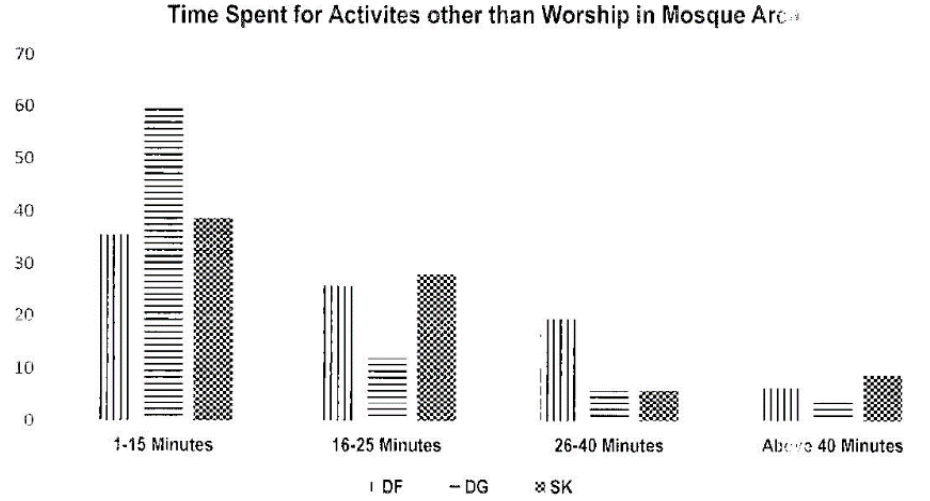

Figure 1(b): Time Spent by Respondent doing other Activites other than Prayer in Percentage (%)

Level of adequacy of architectural and technical aspects of mosque building

Findings on level of adequacy (LA) of the physical as well as the technical aspects of the studied mosques are as shown in Table 2 (a & b) respectively. The findings of the architectural spaces/elements *(A1)* as well as provided facilities *(A2)* were presented in Table 2(b). The results indicate that highest percentage of respondents in Dangote hostel (42%) under *A1,* indicated the level of adequacy of prayer hall as very low. However, majority of respondents in Sassakawa (29.8%) indicated very high-quality score on prayer hall. Furthermore, more than half of respondents in Danfodio hostel (58.1%) indicated that their ablution fountain was of very low quality whereas the same element was indicated by majority of respondents (22.8%) in Sassakawa as having a very high quality. Similarly, under the provided facilities (A2), the highest number of respondents (80.6) opined that their toilet facilities in Danfodio was of very low quality followed by Dangote toilet with (52%) of respondents rating it as having a very low quality. The highest number (17.5%) of respondents in Sassakawa however, indicated that their toilet facilities were of very high quality.

Table 2a: Level of Adequacy of Physical Aspects of Mosque Building and Provided Facilities

A. Quality of Physical Aspects of Mosque Building/Facilities (%)	Very Low			Low			Moderate			High			Very High		
	DF	DG	SK	DF	DG	SK	DF	DG	SK	DF	DG	SK	DF	DG	SK
A1. Architectural Spaces/Elements and Facilities															
Prayer Hall (Congregation)	22.6	42	7	29	28	14	25.8	16	14	12.9	10	21.1	6.5	2	29.8
Ablution Fountain	58.1	16		19.4	40	8.8	12.9	17.5	17.5	6.5	4	17.5	3.2	2	22.8
Prayer Niche	19.2	22	1.8	19.4	24	7	45.2	34	22.8	3.2	6	8.8	3.2	8	19.3
External Appearance of the Mosque	22.6	16	1.8	35.5	38	15.8	25.8	22	19.3	6.5	8	8.8	3.2		15.8
Availability and Quality of Design for Disabled Persons	22.6	12		41.9	32	12.3	29	20	19.3	3.2	18	12.3	3.2	4	22.8
Number of Entrances	6.5	14	1.8	25,8	20	14	25.8	36	14	22.6	2	10.5	16.1	10	21.1
Internal Appearances	19.4	24	5.3	29	20	5.3	29	22	19.3	12.9	18	15.8	9.7	4	14
Imams Office	35.5	34	5.3	12.9	34	8.8	35.5	14	24.6	6.5	4	12.3	9.7	6	21.1
A2. Provided Facilities															
Toilet Facilities	80.6	52	8.8	3.2	16	21.1	6.5	8	21.1	3.2	10	10.5	6.5	4	17.5
Accessibility Quality to The Mosque	6.5	22	1.8	29	40	12.3	41.9	16	26.3	12.9	8	10.5	6.5		15.8
Shoe Racks		34	5.3	45.2	36	8.8	16.1	20	22.8	3.2	2	8.8			24.6
Shelf Books	9.7	20	5.3	32.3	36	10.5	32.3	22	19.3	19.4	4	8.8	6.5	2	15.8
Type of Floor Finish for Delineating Sahu	9.7	34	5.3	41.9	24	8.8	35.5	24	28.1	9.7	6	3.5	3.2	8	24.6

DF= Danfodio, N = 31 DG= Dangote Hostel N= 50 SK= Sassakawa Hostel, N = 51

Similarly, the results of the analysis of the technical aspects of the mosque consisting of quality adequacy of the technical quality (*B1*) and support services (*B2*) are presented in Table 2(b). The findings indicated that under *B1*, the highest number of respondents (48.4%) indicated visual quality of lighting and luminance in prayer hall as moderately qualitative in the Danfodio hostel. This same space in Sassakawa hostel, however, was rated as having very high quality by majority of respondents. Overall, the highest number of respondents felt that support services across all mosques were of moderate quality, followed by respondents who felt that they were of very high quality. The results also indicated that the least number of respondents were of the opinion that Dangote mosque design and support services were of either high or very high qualities.

Habitability Quality Index (HQI) of measured variables

The results of analysis as presented in Table 3 shows that majority of variables across the three mosques made moderate contributions with HQI scores between 0.4-0.59. This trend cut across the four subcomponents i.e. Architectural Spaces/Elements (*A1-ASE & F*), Provided Facilities (A2-PF), Technical Quality of Main Mosque Design (B1-TQMM) and Quality of Mosque Support Services (*B2-TQMSS*). Overall, the ''number of entrances for ease of entry and exit'' variable with HQI value of .729 recorded in Danfodio hostel made the highest contribution towards the quality across the three mosques studied closely followed by prayer hall with HQI value of .717 in Sassakawa hostel mosque. The variables that made the third and fourth contributions towards quality adequacy were sanitation (HQI=.658) and security (HQI=627). Similarly, the variables that made the least contributions to the quality of studied mosques was toilet facility with HQI value of .296 followed by ablution fountain (HQI = .309) both in Danfodio hostel under A1-ASE & F subcomponent. Variables under technical aspects of the mosque design (B1-TQMM), such as visual quality of lighting (HQI=.554, .424 & .588), structural integrity (HQI= .503, .42 & .509) and Clearstory lighting (HQI= .451, 496 & .422) however, seem to make moderate contribution to the quality of these mosques.

Table 2b: Level of Adequacy of Technical Aspects of Mosque Design and Support Services (B)

B. Quality of Technical Aspects of Mosque Design/Support Services (%)	Very Low			Low			Moderate			High			Very High		
	DF	DG	SK	DF	DG	SK	DF	DG	SK	DF	DG	SK	DF	DG	SK
B1. Technical Quality of Main Mosque															
Visual Quality of Lighting in Prayer Hall	3.2	30	10.5	29	26	7	48.8	26	26.3	12.9	8	10.5	3.2	4	24.6
Thermal Comfort in Congregation Hall	3.2	10	3.5	29	28	5.3	41.9	42	17.5	16.1	2	21.1	6.5	6	21.1
Acoustic Control from Outside Mosque	19.4	14	7	25.8	16	8.8	38.7	40	14	9.7	6	14	3.2	12	24.6
Structural Integrity of Mosque Building)		24	1.8	35.5	46	7	16.1	12	15.8	19.4	8	21.1	3.2	4	21.1
Indoor Air Quality in Congregation Hall	6.5	14	5.3	38.7	30	5.3	45.2	36	21.1	3.2	4	10.5	3.2		19.3
Clerestory Lighting	16.1	16	5.3	19.4	32	10.5	38.7	24	19.3	9.7	22	3	9.7	4	22.8
B2. Quality of Mosque Support Services															
Sanitation (Cleanliness of Spaces, Places and Facilities)	3.2	26	5.3	25.8	20	7	35.5	30	7	25.8	16	21.1	6.5	6	33.3
Security (Quality of Entrance Doors and Windows, Key to Doors)	6.5	12	3.5	45.2	28	8.8	32.3	32	10.5	12.9	12.9	17.5	8	8	29.8
Fire Safety (Adequate Number and Marking of Fire Escape Routes)	41.9	30	5.3	22.6	26	8.8	29	26	14	3.2	3.2	10.5	4	4	26.3
Water Supply (Availability and Quality)	61.3	16	5.3	25.8	42	7	6.5	28	19.3	3.2	5.3	5.3		2	33.3
Electricity Services (Availability and Quality)	3.2	18	8.8	25.8	30	3.5	41.9	16	21.1	19.4	22	7	6.5	14	31.6

DF= Danfodio, N = 31 DG= Dangote Hostel N= 50 SK= Sassakawa Hostel, N = 51

Table 3: Habitability Quality Index (HQI) of Measured Variables

Measured Variables	*Danfodio (DF)*		*Dangote(DG)*		*Sassakawa (SK)*		*Var. Subcomponent*
	HQI	*QL*	*HQI*	*QL*	*HQI*	*QL*	
Prayer Hall (Congregation)	0.496	Moderate	0.4	Moderate	0.717	High	*A1-ASE & F*
Ablution Fountain	0.309	Low	0.41	Moderate	0.527	Moderate	*A1-ASE & F*
Prayer Niche	0.477	Moderate	0.43	Moderate	0.478	Moderate	*A1-ASE & F*
External Appearance of Mosque	0.477	Moderate	0.416	Moderate	0.466	Moderate	*A1-ASE & F*
Availability and Quality of Design for Disabled Persons	0.477	Moderate	0.432	Moderate	0.501	Moderate	*A1-ASE & F*
Number of Entrances for Ease of Access and Exits	0.729	High	0.448	Moderate	0.442	Moderate	*A1-ASE & F*
Internal Appearances (Paint Type, Colour, Etc.)	0.541	Moderate	0.42	Moderate	0.513	Moderate	*A1-ASE & F*
Imams Office	0.483	Moderate	0.384	Low	0.556	Moderate	*A1-ASE & F*
Toilet Facilities	0.296	Low	0.328	Low	0.498	Moderate	*A2- PF*
Accessibility Quality to The Mosque	0.548	Moderate	0.356	Low	0.482	Moderate	*A2- PF*
Shoe Racks	0.445	Moderate	0.324	Low	0.423	Moderate	*A2- PF*
Shelf for Keeping the Quran and Other Religious Books	0.522	Moderate	0.368	Low	0.556	Moderate	*A2- PF*
Type of Floor Finish for (Congregation)	0.522	Moderate	0.436	Moderate	0.541	Moderate	*A2- PF*
Visual Quality in Prayer Hall	0.554	Moderate	0.424	Moderate	0.588	Moderate	*B1- TQMM*
Thermal Comfort In Congregation Hall	0.58	Moderate	0.452	Moderate	0.341	Low	*B1- TQMM*
Acoustic Control (Noise from Outside Mosque)	0.606	High	0.464	Moderate	0.474	Moderate	*B1- TQMM*
Structural Integrity of Mosque Building	0.503	Moderate	0.42	Moderate	0.509	Moderate	*B1- TQMM*
Indoor Air Quality in Congregation Hall	0.47	Moderate	0.396	Low	0.458	Moderate	*B1- TQMM*
Clerestory Lighting	0.451	Moderate	0.496	Moderate	0.422	Moderate	*B2- TQMSS*
Sanitation (Cleanliness of Spaces, Places and Facilities)	0.606	High	0.508	Moderate	0.658	High	*B2- TQMSS*
Security	0.406	Moderate	0.496	Moderate	0.627	High	*B2- TQMSS*
Fire Safety (Marking of Fire Escape Routes)	0.38	Moderate	0.412	Moderate	0.521	Moderate	*B2- TQMSS*
Water Supply (Availability and Quality)	0.316	Low	0.46	Moderate	0.537	Moderate	*B2- TQMSS*
Electricity Services (Availability and Quality)	0.574	Moderate	0.568	Moderate	0.564	Moderate	*B2- TQMSS*

Key: ***A1-ASE & F*** - Architectural Spaces/Elements and Facilities, ***A2- PF***- Provided Facilities, ***B1- TQMM***- Technical Quality of Main Mosque Design, ***B2- TQMSS***- Quality of Mosque Support Services, HQI - Habitability Quality Index, QL- Quality Level

Conclusion

This paper assessed the quality adequacy of residential hostel for male students in Ahmadu Bello University Zaria, Nigeria. The study was conducted using three male students' hostel as case studies. Specifically, two major aspects that contribute to the overall quality adequacy of the cases studied mosques were assessed; physical aspects of mosque building and provided facilities on one hand and technical aspects of mosque design and provided support services on the other. Whereas in general, it was found out that majority of respondents were of the opinion that the level of quality adequacy of variables across studied mosques were moderately qualitative.

Interesting conclusions could be drawn from the findings above. For example, the 1-5 years' time period in which majority of students reported to have worshipped in the mosque could be used by mosque management committees as a minimum time period to carry out general maintenance, renovation or upgrade of facilities on the mosques. This should be in addition to routine repairs such as replacement of broken water closet (WC) and expired lighting bulbs among others. Similarly, the results which indicate that high number of students used the mosque for reading activity could probably be attributed to absence of reading facilities in their bedrooms which may arise due to lack of space for reading tables/chairs and bookshelves. Provision of furniture requirements in student's hostels can partly be achieved by freeing up spaces through reduction of number of students assigned in a room will help achieve this. In view of level of adequacy of variables, however, and particularly prayer hall for congregational

prayer in Dangote hostel which was rated as very low, there is the immediate need to carry out a structural redevelopment on the mosque to integrate key elements such as good dedicated toilet facility, ablution fountains, expansion of prayer hall, use of modern building materials such as tiles for floor finish among other to enhance observance of prayers. Although, many respondents rated external appearance of the mosque and availability and quality of design for the disabled ''highly'' there is still the need to continuously maintain the mosque facades in good condition by regularly undertaking painting and decoration works. Similarly, the shelf for keeping the Quran and floor finishes in Danfodio and Dangote hostels that were reported to have very low qualities, need be replaced with materials that requires easy maintenance. For example, the book shelves can be made of Aluminium and glass while carpet that was used as floor finish could be replaced with tiles.

On the overall contribution made by individual variables to the quality adequacy of student's hostel mosque, and which indicated ''number of entry and exit doors'' as the highest contributor, there is the need to architecturally redesign entrance doors of hostel mosques. This can be achieved through a holistic redesign of the entrance doors based on estimated number of worshippers in relation to type and dimensions of the doors. Similarly, variables that made high contribution to quality adequacy of Danfodio and Sassakawa mosques that include ''sanitation'', there will be the need to improve on the current practice of sanitation by providing additional sources of sustainable water supply such as boreholes in close proximity to the mosque to facilitate cleaning of the mosque and cleansing among worshippers. Toilet facility and ablution fountain that made the least contributions to the quality of studied mosques however, should be considered as the variables and elements that needed immediate improvement using building materials and finishes that can withstand the of pressure of use by male students in their hostel mosques.

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